



## City of Ketchum

January 3, 2023

Mayor Bradshaw and City Councilors  
City of Ketchum  
Ketchum, Idaho

Mayor Bradshaw and City Councilors:

**Recommendation to approve Resolution 23-002 which authorizes Grant Submittal to the Local Highway Technical Assistance Council (LHTAC) for the Construction of Warm Springs Road/Lewis Street/10<sup>th</sup> Street Realignment and Roundabout**

Recommendation and Summary

Staff is recommending approval of Resolution 23-002 which will authorize city staff to submit a grant to the Local Highway Technical Assistance Council (LHTAC) for the construction of the Warm Springs Road/Lewis Street/10<sup>th</sup> Street realignment and roundabout.

**"I move approval of Resolution 23-002 and instruct staff to submit the grant application."**

The reasons for the recommendations are as follows:

- The city initiated a technical alternatives analysis via HDR Engineering to address existing vehicular and pedestrian safety deficiencies on Warm Springs Road, both at the Lewis Street intersection as well as 10<sup>th</sup> Street.
- Several in-person and online public feedback sessions were held where clear support was demonstrated for Alternative Four.
- City Council reviewed the full final technical report and concurred with the HDR recommendation of Alternative Four as the preferred local design alternative.
- City Council instructed staff to explore state or federal funding sources for the construction of the project as local funds are limited.

Sustainability Impact

No direct impact. The project seeks to improve pedestrian and bicycle facilities along the corridor which should increase alternative mobility choices.

Financial Impact

A local match of \$598,796 will be required should the city receive the LHTAC grant.

Attachments

Resolution 23-002  
Warm Springs Alternative Analysis – Final Report

RESOLUTION NUMBER 23-002

A RESOLUTION OF THE CITY OF KETCHUM CITY COUNCIL  
APPROVING GRANT SUBMITTAL TO THE LOCAL HIGHWAY TECHNICAL ASSISTANCE COUNCIL (LHTAC) FOR THE  
CONSTRUCTION OF WARM SPRINGS ROAD/LEWIS STREET/10<sup>th</sup> STREET REALIGNMENT AND ROUNDABOUT

WHEREAS, the City of Ketchum has completed a technical alternatives analysis led by HDR Engineers to address vehicular and pedestrian deficiencies at the intersections of Warm Springs Road/Lewis Street and Warm Springs Road/10<sup>th</sup> Street; and

WHEREAS, the public and adjacent landowners were involved in several community feedback sessions and there was clear support of Alternative Four outlined in the final report: and

WHEREAS, the Ketchum City Council evaluated the technical findings contained in the report and voted to support Alternate Four and instructed staff to explore state or federal funds sources to be matched with limited local funds.

NOW THEREFORE BE IT RESOLVED by the Mayor and Council of the City of Ketchum to:

1. Instruct city staff to submit a Local Federal -aid STBG-Rural Program Grant Application to the Local Highway Technical Assistance Council (LHTAC) for the construction of the Warm Springs Road/Lewis Street/10<sup>th</sup> Street Realignment and Roundabout.
2. Acknowledge that the total project cost estimate is \$8,157,982 which will require \$598,796 matching funds available from the City of Ketchum.
3. The Mayor is hereby authorized to sign the project application packet and submit to LHTAC for prioritization

APPROVED BY THE COUNCIL THIS 3<sup>rd</sup> DAY OF JANUARY, 2023.

THIS RESOLUTION WILL BE IN FULL FORCE AND EFFECT UPON ITS ADOPTION THIS 3<sup>rd</sup> DAY OF JANUARY, 2023.

CITY OF KETCHUM, IDAHO

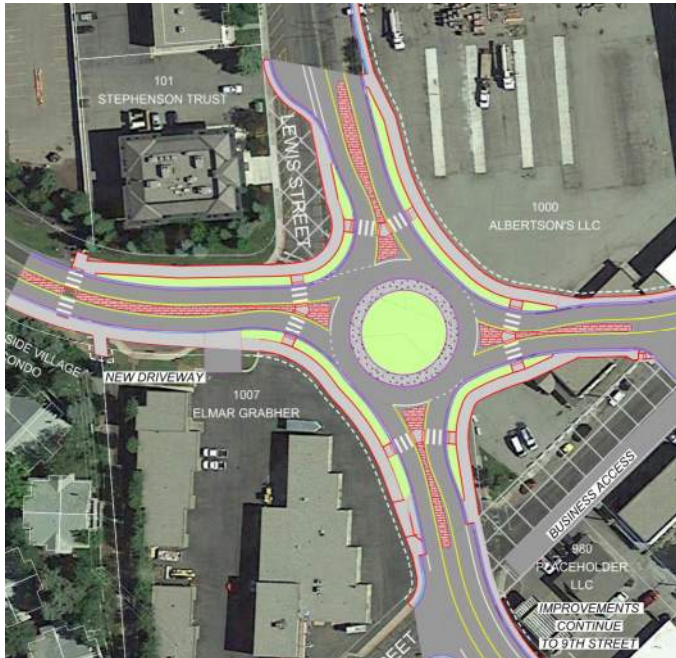
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Mayor Neil Bradshaw

ATTEST:

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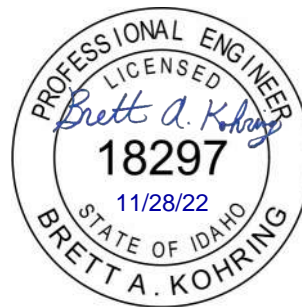
Trent Donat, City Clerk



# Warm Springs Road Alternatives Analysis Concept Report

City of Ketchum

Ketchum, Idaho  
November 28, 2022



# Executive Summary

The City of Ketchum, Idaho (City) *Master Transportation Plan* (2021) identified the Warm Springs Road corridor between 10<sup>th</sup> Street and Lewis Street for enhancement and development of conceptual alternatives to improve the area. This corridor experiences relatively high traffic volumes connecting recreation and residences to the downtown core and beyond. The study area for conceptual alternatives includes the intersections of 10<sup>th</sup> Street and Main Street (SH-75), Warm Springs Road and 10<sup>th</sup> Street, and Warm Springs Road and Lewis Street.

The Warm Springs Road corridor – from its diversion from Main Street at 6<sup>th</sup> Street to its entry into residential West Ketchum – is diverse in its land use and is a nexus of several neighborhoods and zoning districts. Currently, the three zoning districts in the area provide an abrupt transition from one to the next and do not provide a gateway experience. The area lacks many of the basic public realm amenities or elements to make it feel a part of the City, including comfortable and consistent sidewalks and a diversity of shared open space. Overall, the area lacks a consistent and safe public realm, which is critical to extend the vibrancy of downtown to this area, provide an identity, or present a gateway to or from the downtown core or Warm Springs Road.

Under existing conditions, the study intersections are all estimated to operate at a level of service (LOS) C or better during peak season morning (AM) and evening (PM) peak hours. The worst performing intersection is the 10<sup>th</sup> Street and Warm Springs Road intersection, which experiences 17-second delays during the peak hours for the left turning movements from 10<sup>th</sup> Street. During the off-peak periods, the intersections operate at a LOS B or better during the AM and PM peak hours, meaning delays are less than 15 seconds at each intersection.

During the 5-year study period, there was one crash near the intersection of Warm Springs Road/Lewis Street and one crash at the intersection of Warm Springs Road/10<sup>th</sup> Street. Both crashes occurred during the noon hour on a weekday with clear conditions. The cause of the possible injury crash near Warm Springs Road and Lewis Street was caused by a driver following too close and was not related to the intersection. The crash at the intersection of Warm Springs Road/10<sup>th</sup> Street was a left turning crash where the driver failed to yield. There were no injuries associated with this crash.

Although the number of crashes in the study area is low, conversations with the public at public involvement meetings, City staff, and City Council members revealed safety concerns with the corridor. These concerns increase the amount of stress that pedestrians, bicyclists and motorists feel while traversing the area. These perceived safety issues include restricted sight distance for a southbound vehicle turning left at 10<sup>th</sup> Street onto Warm Springs with the gas station pumps, long pedestrian crossings across intersections or private approaches, inconsistent and aged sidewalks, and a lack of facilities compliant with the Americans with Disabilities Act (ADA) and Public Rights-of-Way Accessibility Guidelines (PROWAG).

The project team developed and proposed five alternatives for qualitative analysis to improve the surrounding land use in the study area:



- Alternative 1: 10<sup>th</sup> Street Roundabout
- Alternative 2: Lewis Street Roundabout
- Alternative 3: 10<sup>th</sup> Street and Lewis Street Dog bone roundabout
- Alternative 4: 10<sup>th</sup> Street and Lewis Street Realignment & Roundabout
- Alternative 5: Block/Street Realignment.

The five build alternatives and a No Build option were presented to the public for comment and feedback at public meetings. The project team developed a screening process to evaluate each of the alternatives using 11 criteria identified in discussion with City staff. City staff and members of the project team rated each alternative as good, neutral, or poor for each of the criteria. Based on an aggregated score and public feedback, HDR and City staff recommended Alternative 2, Alternative 4, and the No Build option move forward to the City Council (July 18, 2022). The City Council concurred with the recommendation and advanced the three alternatives.

In terms of public realm improvements and future land use, Alternative 4 has the most potential benefit followed by Alternative 2, while the No Build option provides few opportunities. Both the roundabout options would maintain the opportunity for the Albertson’s property to redevelop and provide opportunities for a placemaking. Both alternatives would enhance bike and pedestrian connectivity and safety by removing conflict points with vehicles and shortening pedestrian exposure. In conversations with Mountain Rides, bus transit facilities would need to be relocated in the general area, but operations would not be negatively impacted by either option. Mountain Rides commented that Alternative 4 would enhance operations by removing a difficult turn.

The City does not lie within boundaries of a Municipal Planning Organization (MPO) that would produce a travel demand model that projects trip generation out into the future. HDR instead calculated a 1.44 percent historical growth rate to represent traffic volume growth based on historical data from Idaho Transportation Department’s (ITD) Automated Traffic Recorders (ATRs) on State Highway 75 (SH-75). Design year 2042 was selected for the purposes of this analysis and LOS D was set for the target LOS threshold. HDR analyzed the study intersections using the forecasted volumes and found that both Alternatives 2 and 4 are estimated to operate well in the design year, with vehicle delays at approximately 10 seconds for the improved intersections. The unimproved intersections are expected to operate adequately in the design year.

The following table shows the opinion of probable costs for each of the two build alternatives:

Cost	Alternative 2	Alternative 4
Engineering Fee	\$288,000	\$398,000
Construction Cost	\$1,532,000	\$2,117,000
Right-of-way Cost	\$1,075,100	\$4,461,700
<b>Total Project Cost</b>	<b>\$3,278,100</b>	<b>\$7,506,700</b>

The realigned roadway in Alternative 4 requires purchasing large amounts of right-of-way (ROW) and these costs make up the largest difference between the two alternatives. Alternative 4 also creates an opportunity for the City to vacate the abandoned 10<sup>th</sup> Street connection and sell it to adjacent land owners. The vacated parcel's estimated value is \$1,277,325 and the revenue from the sale could be used to offset some of the ROW costs. This would be determined during ROW negotiations.

If the City can acquire funding to cover the higher ROW and construction costs, Alternative 4 is recommended. This alternative best improves multi-modal connectivity and operations, simplifies the roadway network, provides the most opportunity for placemaking, and is preferred by both Mountain Rides and the public. However, Alternative 4 costs are significantly higher; therefore, Alternative 2 is recommended if funding for Alternative 4 cannot be secured. Alternative 2 still provides traffic calming, multi-modal, placemaking, and safety benefits to the area. The No Build option is not recommended as it does not provide benefits meeting the City's goals. **Appendix G** contains final concept exhibits for each alternative.

As the City pursues funding for the larger aspects of the build alternatives, there are several opportunities to enhance the area in the meantime. Even if the City chooses the No Build option, the City could consider the following improvements. **Appendix H** contains conceptual exhibits of potential improvements.

- Restripe the two-way left turn (TWLT) lane in front of the gas station to be a dedicated left turn lane. This will prevent delivery vehicles from parking close to the intersection.
- Replace dilapidated sidewalk, install sidewalk where none exists within the study area, and install ADA/PROWAG-complaint pedestrian ramps.
- Install bulb-outs at the Lewis Street and Warm Springs Road intersection to shorten pedestrian crossings.
- Explore one or more of the following options to mitigate the difficult 10<sup>th</sup> Street left turn sight distance issue:
  - Prohibit southbound left turns at the intersection by signage or adding a diverter in the intersection.
  - Convert the intersection from two-way stop control to all-way stop control.



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- Appendix B: Existing Capacity Analysis Reports
- Appendix C: First Public Involvement Summary
- Appendix D: High Level Screening Criterion Definitions
- Appendix E: Future Operations Results
- Appendix F: Second Public Meeting Summary
- Appendix G: Final Concept Exhibits
- Appendix H: Additional Improvement Concepts

## Acronyms/Abbreviations

Acronyms and abbreviations used more than once in the report text.

ADA	Americans with Disabilities Act
ATR	automated traffic recorders
City	City of Ketchum
CMF	crash modification factor
HCM	Highway Capacity Manual
ITD	Idaho Transportation Department
LOS	level of service
NBL	Northbound left
NBT/L	Northbound through left
NEL	Northeast left
NET/L/R	Northeast through left right
NET/LR	Northeast through left right
PROWAG	Public Rights-of-Way Accessibility Guidelines
ROW	right-of-way
SBL	Southbound Left
SBR	Southbound right
SEL	Southeast left
SWT/L/R	Southwest through left right
TWLT	two-way left turn
v/c	volume to capacity ratio
vpd	vehicles per day

# 1 Introduction

## 1.1 Background and Purpose

The City of Ketchum, Idaho (City) *Master Transportation Plan* (2021)<sup>1</sup> identified the Warm Springs Road corridor between 10<sup>th</sup> Street and Lewis Street for enhancement. This corridor experiences high traffic volumes connecting recreation and residences to the downtown core and beyond. The *Master Transportation Plan* identified the intersections at 10<sup>th</sup> Street and Lewis Street for further evaluation and development of conceptual alternatives to improve the area. The purpose of this report is to document the concept study process and the decision-making process and recommend an alternative to meet the City’s goals.

## 1.2 Study Area

The study area is bounded by the following three intersections: 10<sup>th</sup> Street and Main Street (State Highway 75 [SH-75]), Warm Springs Road and 10<sup>th</sup> Street, and Warm Springs Road and Lewis Street. The study area is shown in Figure 1. The surrounding land use is zoned as light industrial and features several small businesses, including a gas station on the southeast corner of Warm Springs Road and 10<sup>th</sup> Street. The Warm Springs Road corridor provides access from residential developments in the northwest part of the City to the downtown core. Nearby traffic generators include the Ernest Hemingway STEAM School to the southwest, the YMCA to the northwest, and the City’s downtown core to the southeast. A large undeveloped lot, owned by Albertsons Corporation, is located along Warm Springs Road between 10<sup>th</sup> Street and Lewis Street.

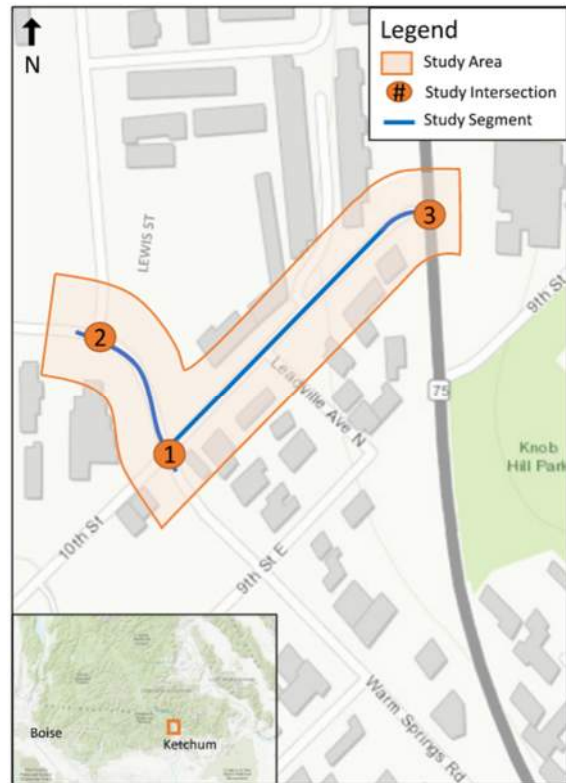


Figure 1. Study Area

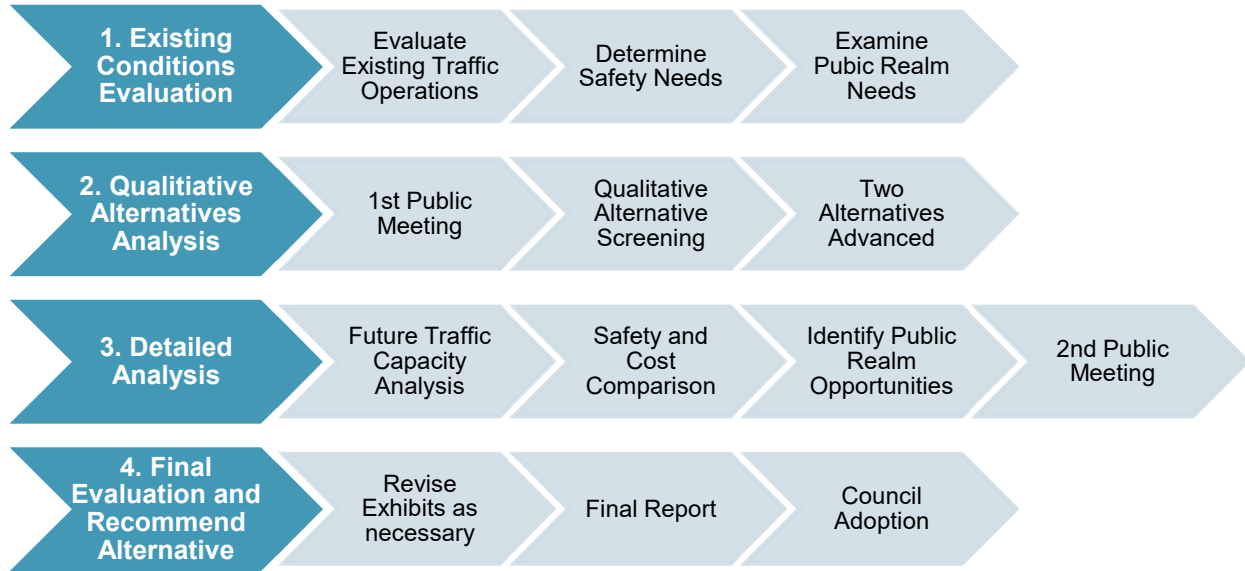
## 1.3 Study Process

The study process followed the procedure outlined in Figure 2. The project team performed an initial evaluation of existing conditions in the study area that evaluated the existing traffic operations, determined the safety needs and examined the public realm needs. Then, the project team developed a series of potential alternatives for presentation to the public that were also evaluated by City and consultant staff based on 11 criteria, developed in consultation with the City. The City and project team recommended two alternatives for detailed analysis to the City Council. This detailed analysis included identifying potential public realm enhancements, future traffic capacity analysis, safety benefits, and a cost comparison. Finally, the project team

<sup>1</sup> City of Ketchum, Master Transportation Plan. March 15, 2021.

revised the alternatives, as necessary, prepared a final report, and presented it to the City Council for adoption.

At each stage during the process, the project team engaged stakeholders, including Mountain Rides, surrounding businesses, the YMCA, and adjacent landowners. Public comment was solicited at two public meetings where residents could evaluate the alternatives, ask questions, and provide feedback. Online surveys accompanied each public meeting for those unable to make the in-person meetings.



**Figure 2: Study Process**

## 1.4 Organization of Report

Following the introduction in Section 1, this report is also organized following the general structure of the study process shown in Figure 2.

- Section 2 describes existing conditions and determines needs;
- Section 3 reviews the first public meeting and qualitative alternatives analysis;
- Section 4 describes the detailed analysis and reviews the second public meeting; and
- Section 5 compares the alternatives, considers mitigation and other issues, makes recommendations, and describes next steps.

## 2 Existing Conditions Evaluation

### 2.1 Land Use

The Warm Springs Road corridor – from its diversion from Main Street at 6<sup>th</sup> Street to its entry into residential West Ketchum at the Big Wood River crossing – is diverse in its land use and is a nexus of several neighborhoods and districts. At its southeastern end, the corridor acts as a lower-intensity extension of the downtown core and has an eclectic mix of uses, including restaurants, homes, and retail. In this stretch, Warm Springs Road is straight and contributes to the downtown block structure and scale found in the downtown core and neighborhoods further to the east.



**Figure 3. Character Areas of Warm Springs Road**

Approaching 10<sup>th</sup> Street, the corridor begins to exhibit uses and features indicating its connection to the industrial zone that extends north along Lewis Street. This area includes a mix of light industrial and commercial spaces. The most prominent land use in this section is the large, vacant parcel on the northern edge of the corridor and west of 10<sup>th</sup> Street along Lewis

Street. Ketchum's *2014 Comprehensive Plan*<sup>2</sup> identifies this stretch as a part of the industrial neighborhood and as having a future Mixed-Use Industrial land use.

Crossing the popular Wood River Trail, the land use shifts again with single- and multi-family residences defining its southern edge and the substantial YMCA recreation and community center. Beyond the YMCA, the Guy Coles Skate Park occupies the stretch of land leading to the Wood River. This public institutional land use defines this part of the corridor and acts as a landmark.

Though the YMCA is a large, recognizable landmark, the transition from this portion of the corridor into the downtown core is not well-defined through the land uses or buildings. The three distinct zones, described above and shown in Figure 3, provide a somewhat erratic transition from one to the next and do not provide a gateway experience. This corridor is a primary corridor connecting Downtown to the Warm Springs neighborhood and ski mountain; therefore, there is an opportunity for this portion of the corridor to act as a gateway between the areas.

## 2.2 Public Realm

Currently, the Warm Springs Road corridor from Main Street (SH-75) to the Wood River lacks many basic public realm amenities or elements to make it feel like a part of the City. Many of the amenities and facilities found in or around the downtown core – such as comfortable and consistent sidewalks and a diversity of shared open space, among others – are not found throughout this portion of the corridor. Some areas, such as the stretch from Main Street (SH-75) to 10<sup>th</sup> Street, lack sidewalks altogether, whereas others have small, attached sidewalks that do not provide a safe or a comfortable experience for pedestrians. Similarly, there is no comfortable, on-street cycling infrastructure along much of the corridor other than a 5' wide bike line on the west side of Warm Springs Road from 9<sup>th</sup> Street to 6<sup>th</sup> Street and the Wood River trail connection just south of the YMCA. The Wood River Trail is an important connector through the community and is well-used by residents and visitors, though it does not supplant the need for safer, street-adjacent sidewalks or cycle facilities as prescribed in Goal M-4 of the *2014 Comprehensive Plan*.

Other amenities and pedestrian-oriented lighting, are almost entirely absent in this area. The Blue and Bronze route bus stops at Lewis Street, for example, only provide seating in the eastbound direction and this single bench is unprotected from the elements.

The area has several open spaces nearby, including Atkinson Park (connected by the Wood River Trail), and the public spaces around the YMCA, including the Guy Coles Skate Park. These open spaces are important to the area and provide well-used amenities for the community but act more as “community” open spaces as opposed to “neighborhood” open spaces, as defined in the *2014 Comprehensive Plan*.

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<sup>2</sup> City of Ketchum, 2014 Comprehensive Plan. February 18, 2014. Accessible online: [https://www.ketchumidaho.org/sites/default/files/fileattachments/planning\\_and\\_building/page/2131/2014\\_compplan\\_a\\_dopted\\_cc\\_2-18-14\\_final\\_201403281009599481.pdf](https://www.ketchumidaho.org/sites/default/files/fileattachments/planning_and_building/page/2131/2014_compplan_a_dopted_cc_2-18-14_final_201403281009599481.pdf)

Overall, the area lacks a consistent and safe public realm critical to extend the vibrancy of downtown to this area, provide an identity, or present a gateway to or from the downtown core or Warm Springs Road.

## 2.3 Existing Traffic Operations

### 2.3.1 Intersection Layout and Traffic Control

The Lewis Street intersection is a T-intersection with stop control on the Lewis Street leg. At this intersection, Warm Springs Road has three-lanes with one travel lane in each direction and a center continuous two-way left turn (TWLT) lane. Additionally, the east leg of the intersection features a dedicated right-turn lane for westbound traffic to turn onto Lewis Street. Lewis Street features one right-turn lane, one left turn lane and one receiving lane with diagonal on-street parking on the west side and parallel on-street parking on the east side. Sidewalk is present along the south side of Warm Springs Road and the west side of 10<sup>th</sup> Street. The east leg of the intersection has sidewalk on both sides of the road. A crosswalk exists on the north leg of the intersection. Transit stops are present in both directions east of the intersection. Figure 4 shows the Lewis Street Warm Springs Intersection.



Figure 4: Lewis Street and Warm Springs Road Intersection Area

The 10<sup>th</sup> Street intersection is a four-leg intersection with stop control on the 10<sup>th</sup> Street legs. Warm Springs Road is currently striped as a three-lane section with one lane in each direction and a TWLT lane. 10<sup>th</sup> Street features one lane in each direction on each leg and on-street parking on the northeast side of the east leg. Sidewalk is present south of the intersection to the Hemmingway STEAM school and on the south side of Warm Springs Road. Crosswalks exist on all four legs of the intersection; however, no sidewalk is present on the north side of Warm Springs Road or along 10<sup>th</sup> Street to the north. Figure 5 shows the 10<sup>th</sup> Street and Warm Springs Road intersection area.



**Figure 5. 10th Street and Warm Springs Road Intersection Area**

The 10<sup>th</sup> Street intersection with Main Street (SH-75) is a T-intersection with stop control on the 10<sup>th</sup> Street leg. Main Street (SH-75) is one lane in each direction and has on street parking on the east side of the roadway. 10<sup>th</sup> Street is one lane in each direction with parking on the northeast side of the roadway. No Sidewalks or marked pedestrian crossings are present at this intersection. Figure 6 Shows the 10<sup>th</sup> Street and Main Street (SH-75) intersection area.



Figure 6. 10th Street and Main Street (SH-75) Intersection Area

### 2.3.2 Existing Volume Development

L2 Data Collection acquired turning movement counts for the study intersections on August 31, 2021, between the hours of 7:00AM to 9:00AM and 4:00PM and 6:00PM. For the Warm Springs Road intersections, the AM or morning peak hour was found to begin at 7:45AM while the evening or PM peak hour begins at 4:00PM. At the 10<sup>th</sup> Street and Main Street (SH-75) intersection, the AM peak hour begins at 8:00AM and the PM peak hour begins at 4:00 PM.

**Appendix A** contains summaries of the traffic counts.

In general, the traffic counts indicate a travel pattern where commuters are going to work along the light industrial areas near Lewis Street or Saddle Road in the morning and then commuting home in the evening.

The City of Ketchum is a resort destination community with travel patterns that vary throughout the year. Although the City of Ketchum has no automated traffic recorders (ATR) stations of their own, the Idaho Transportation Department (ITD) has two ATRs at the following locations to record traffic volumes and estimate seasonal variations on SH-75 near Ketchum:

- ATR #28 – SH-75 @ mile post (MP) 135.95 (7.6 miles north of Sun Valley Road)
- ATR #68 – SH-75 @ MP 119.4 (2.9 miles north of Bullion Street in Hailey, ID)

Traffic volumes on SH-75 were analyzed using data from the ATRs to see how they fluctuate throughout a given year. The highest volumes were observed in the summer months, averaging over 15,000 vehicles per day (vpd) in June, July, and August at ATR #68 and around 2,400 vpd at ATR #28. The lowest volumes were observed in the winter months of December, January,



and February with volumes less than 1,200 vpd at ATR #68 and less than 900 vpd at ATR #28. There is a significant drop in volume on the highway from north and south of Ketchum. Table 1 shows the average monthly seasonal factors determined from the historical ATR data. Volumes from 2020 are not included in the analysis due to the Covid-19 pandemic and associated shutdowns.

**Table 1. Monthly Seasonal Factors**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg MSF	0.90	0.94	0.88	0.85	0.93	1.11	1.24	1.19	1.08	1.03	0.88	0.98
w/o 2020	0.89	0.93	0.89	0.89	0.94	1.11	1.24	1.18	1.06	1.02	0.88	0.97

The seasonal adjustment results were calculated by dividing the August 2021 counts by a factor of 1.18. This represents an 18 percent decrease in volumes to represent a typical day. Figure 7 details the results of the volume adjustments.



**Figure 7. Warm Springs AM and PM Peak Hour Turning Movement Counts**

### 2.3.3 Existing Traffic Operations

Capacity is defined as the maximum rate at which vehicles can pass through a given point in an hour under prevailing conditions. Intersection capacity is measured by evaluating the critical lane groups that experience the most delay for stop-controlled intersections. A volume to capacity (v/c) ratio less than 0.85 generally indicates that adequate capacity is available, and vehicles are not expected to experience significant queues or delays. As the v/c ratio approaches 1.0, traffic flow may become unstable and significant delay and queuing conditions may occur. Once the demand exceeds capacity, defined as a v/c ratio greater than 1.0, traffic flow is unstable and excessive delay and queuing is expected. The concept of level of service (LOS) was developed to correlate numerical traffic operational data to subjective descriptions of traffic performance at intersections. LOS is defined as the system of six designated ranges, from “A” (best) to “F” (worst), used to evaluate performance. Table 2 presents the Highway Capacity Manual (HCM) thresholds based on delay at stop-controlled intersections.

**Table 2. LOS Thresholds for Motor Vehicles at Intersections**

LOS	Stop Control Intersection Control Delay (seconds/vehicle)	Roundabout Intersection Control Delay (seconds/vehicle)
A	≤ 10	≤ 10
B	10 – 15	10 – 15
C	15 – 25	15 – 25
D	25 – 35	25 – 35
E	35 – 50	35 – 50
F	> 50	> 50

Source: National Academies Press. Highway Capacity Manual, 6th Ed. A Guide for Multimodal Mobility Analysis.

The project team used Synchro 11 software to model and analyze study area intersections under existing conditions and HCM 6<sup>th</sup> edition analysis methods to produce the analysis reports.

Given the large variability of the traffic volumes during the summer months compared to other months, the project team analyzed intersections with the unadjusted August volumes for comparison. In this scenario, the Warm Springs Road study intersections are all estimated to operate at LOS B or better during off-peak season AM and PM peak hours. Detailed reports from the capacity analyses are available in **Appendix B**.

Table 3 summarizes the capacity analysis results for the Warm Springs study intersections, using the existing traffic counts depicted in Figure 7. In general, the intersections are operating well over capacity with delays under 15 seconds for each movement. All the intersections operate at LOS A or B with vehicle queue lengths under 30 feet.



**Table 3. Warm Springs Road Intersections - Seasonal Adjustment 2021 AM & PM Peak**

Intersection	Overall Intersection LOS	Movement	Delay(s)	LOS	95 <sup>th</sup> Percentile Queue Length (feet)	V/C
10 <sup>th</sup> Street / Warm Springs Road	B (B)	NET/L/R	14.2 (14.3)	B (B)	4.4 (2.2)	0.052 (0.037)
		SWT/L/R	13.3 (14.1)	B (B)	8.8 (13.2)	0.13 (0.174)
		SBL	8.3 (8.1)	A (A)	2.2 (2.2)	0.027 (0.04)
		NBL	7.8 (8.2)	A (A)	0 (0)	0.007 (0.003)
10 <sup>th</sup> Street / SH-75	B (B)	NEL	10.7 (12.4)	B (B)	6.6 (11)	0.096 (0.15)
		NBT/L	7.5 (8.1)	A (A)	2.2 (2.2)	0.017 (0.032)
Warm Springs Road/ Lewis Street	B (B)	SBL	12 (14.9)	B (B)	11 (28.6)	0.137 (0.316)
		SBR	9.6 (9.9)	A (A)	2.2 (2.2)	0.024 (0.042)
		SEL	8.1	A	0 (2.2)	0.015 (0.026)

**2.3.4 Summer Peak Operations**

Given the large variability of the traffic volumes during the summer months compared to other months, the project team analyzed the intersections with the unadjusted August volumes for comparison. The ad study intersections are all estimated to operate at LOS C or better during peak season AM and PM peak hours and Table 4. Warm Springs Road Intersections - August 2021 AM & PM Peak outlines the operational results. Detailed reports from the capacity analyses are available in **Appendix B**.

**Table 4. Warm Springs Road Intersections - August 2021 AM & PM Peak**

Intersection	Overall Intersection LOS	Movement	Delay (s)	LOS	95 <sup>th</sup> Percentile Queue Length (feet)	V/C
10 <sup>th</sup> Street / Warm Springs Road	C (C)	NET/L/R	16.3 (16.9)	C (C)	4.4 (4.4)	0.076 (0.054)
		SWT/L/R	15.1 (17)	C (C)	13.2 (22)	0.174 (0.245)
		SBL	8.6 (8.3)	A (A)	2.2 (4.4)	0.034 (0.049)
		NBL	7.9 (8.4)	A (A)	0 (0)	0.009 (0.003)
10 <sup>th</sup> Street / SH-75	B (B)	NEL	11.4 (13.8)	B (B)	8.8 (15.4)	0.123 (0.198)
		NBT/L	7.6 (8.3)	A (A)	2.2 (2.2)	0.021 (0.04)
Warm Springs Road / Lewis Street	B (B)	SBL	12.9 (17.7)	B (C)	13.2 (44)	0.175 (0.412)
		SBR	9.9 (10.3)	A (B)	2.2 (4.4)	0.03 (0.053)
		SEL	8.5 (8.3)	A (A)	2.2 (2.2)	0.019 (0.032)

## 2.4 Existing Safety Analysis

### 2.4.1 Crash History

During the 5-year study period (2016-2020), there was one crash near the intersection of Warm Springs Road/Lewis Street and one crash at the intersection of Warm Springs Road/10<sup>th</sup> Street. Both crashes occurred during the noon hour on a weekday with clear conditions. The possible injury crash near Warm Springs Road and Lewis Street was caused by a driver following too close and was not related to the intersection. The crash at the intersection of Warm Springs Road/10<sup>th</sup> Street was a left turning crash where the driver failed to yield. There were no injuries associated with this crash.

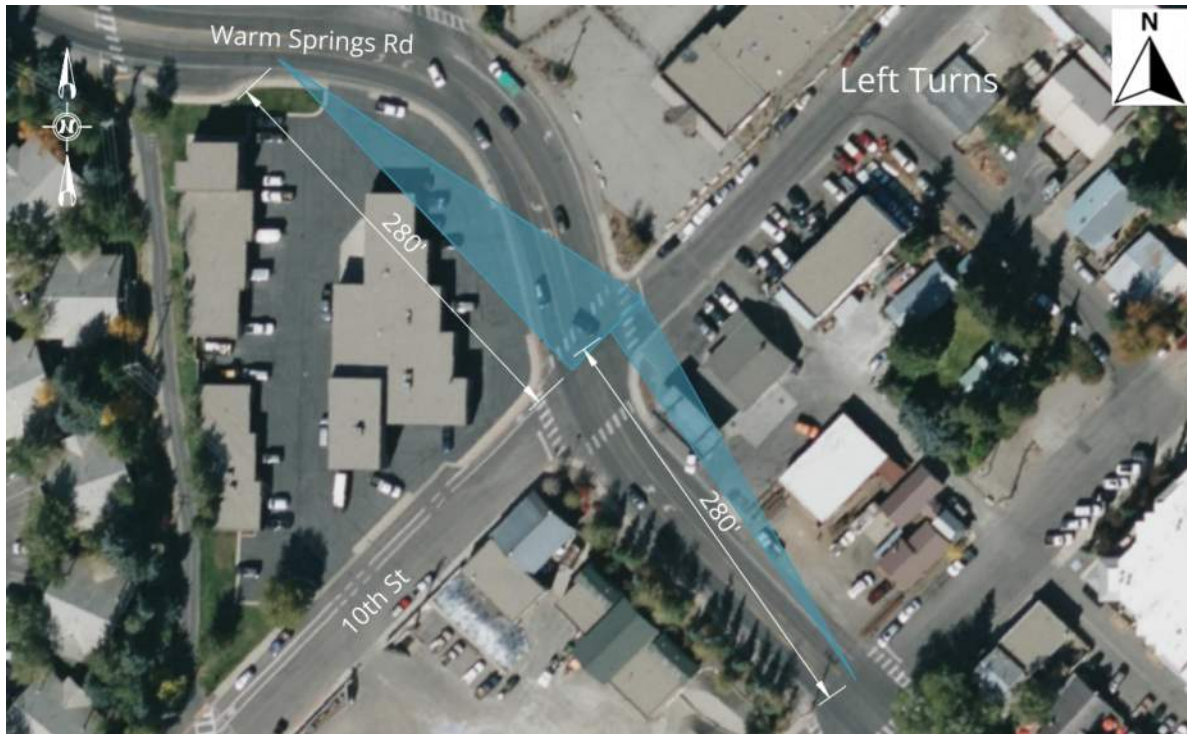
### 2.4.2 Qualitative Safety Analysis

Although the number of crashes in the study area is low, conversations with the public at public involvement meetings, with City staff, and at City Council meetings revealed safety concerns with the corridor, as described in the following bullets. While the concerns may not be producing crashes within the study area, they do increase the amount of stress that pedestrians, bicyclists and motorists feel while traversing the area.

- A southbound driver turning left from 10<sup>th</sup> Street onto Warm Springs has a difficult time seeing cross traffic as the visibility is blocked by the gas station pumps. Multiple individuals commented that they specifically avoided the intersection because of the sight distance issues. An intersection sight triangle analysis was performed using methodologies outlined in Sections 9.5.2.3 and 9.5.3 of the AASHTO *Policy on Geometric Design of Highways and Streets*<sup>3</sup>. A 25 mph design speed was used to evaluate the sight distance. As shown in Figure 8, the gas station blocks the turning vehicle's view of oncoming traffic on Warm Springs Road.

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<sup>3</sup> American Association of State Highway and Transportation Officials (AASHTO). A Policy On Geometric Design of Highways and Streets, 7<sup>th</sup> Edition. 2018



**Figure 8: Left Turn Sight Triangles**

- Multiple private approaches are within 60 feet of the intersection creating conflicts throughout the intersection.
- Pedestrians and bikes are also overexposed. The sidewalks in this area are in disrepair or missing for long sections. Some business approaches are longer than necessary and overexpose pedestrians traversing the sidewalk to turning traffic entering the business as shown in Figure 9. Lewis Street's wide cross section and skewed intersection with Warm Springs creates an approximately 90-foot crossing for pedestrians in that area, shown in Figure 10. Facilities compliant with the Americans with Disabilities Act (ADA) and Public Rights-of-Way Accessibility Guidelines (PROWAG) are not present to alert visually impaired pedestrians that they are entering a conflict area. The Lack of ADA/PROWAG compliant facilities also creates difficulties for disabled individuals to traverse the area.



**Figure 9. Aged Sidewalk and Large Approach At 10<sup>th</sup> & Warm Springs. Source: Google Earth**



**Figure 10. Large Pedestrian Crossing Across Lewis Street**

- The Warm Springs Road shoulder widths between Lewis Street and 10<sup>th</sup> Street are too narrow to support bike lanes, which prevents continuity of the network. This forces cyclists into the travel lanes and increases user stress.

## 2.5 Transit Facilities

Mountain Rides is the local transit authority maintaining bus routes throughout the City of Ketchum. The Blue, Bronze and Valley Routes all provide transit access through this corridor. One stop exists on either side of Warm Springs Road west of Lewis Street. There is a pullout on the route going toward downtown that is no longer of sufficient length for the buses Mountain Rides is using. The pullout is shown in Figure 11. Also, the stops do not feature shelters, or safety lighting. In conversations with Mountain Rides, they expressed concerns with the 10th Street intersection, specifically with how difficult it is to turn right onto Warm Springs Road.



**Figure 11: Existing Mountain Rides Bus Pullout. Source: Google Earth**

# 3 Qualitative Alternatives Analysis

## 3.1 Alternatives

The project team developed five conceptual alternatives for the study area to improve the surrounding land use.

### 3.1.1 Concept Alternative 1 – 10<sup>th</sup> Street Roundabout

Figure 12 shows the concept for Alternative 1. This alternative replaces the existing two-way stop-controlled Warm Springs Road and 10<sup>th</sup> Street intersection with a single lane roundabout. This concept provides good vehicle operations while requiring drivers to slow down approaching and moving through the intersection. Pedestrian facilities would be provided on all legs, connecting to existing facilities, and bikes would be able to travel through the roundabout due to low vehicle speeds or on pathways around the circle, crossing the legs in the pedestrian crosswalks. This concept would require widening the intersection with estimated private and public parking, gas pump, access, and building impacts. The adjacent Warm Springs Road and Lewis Street intersection is not improved with this alternative.

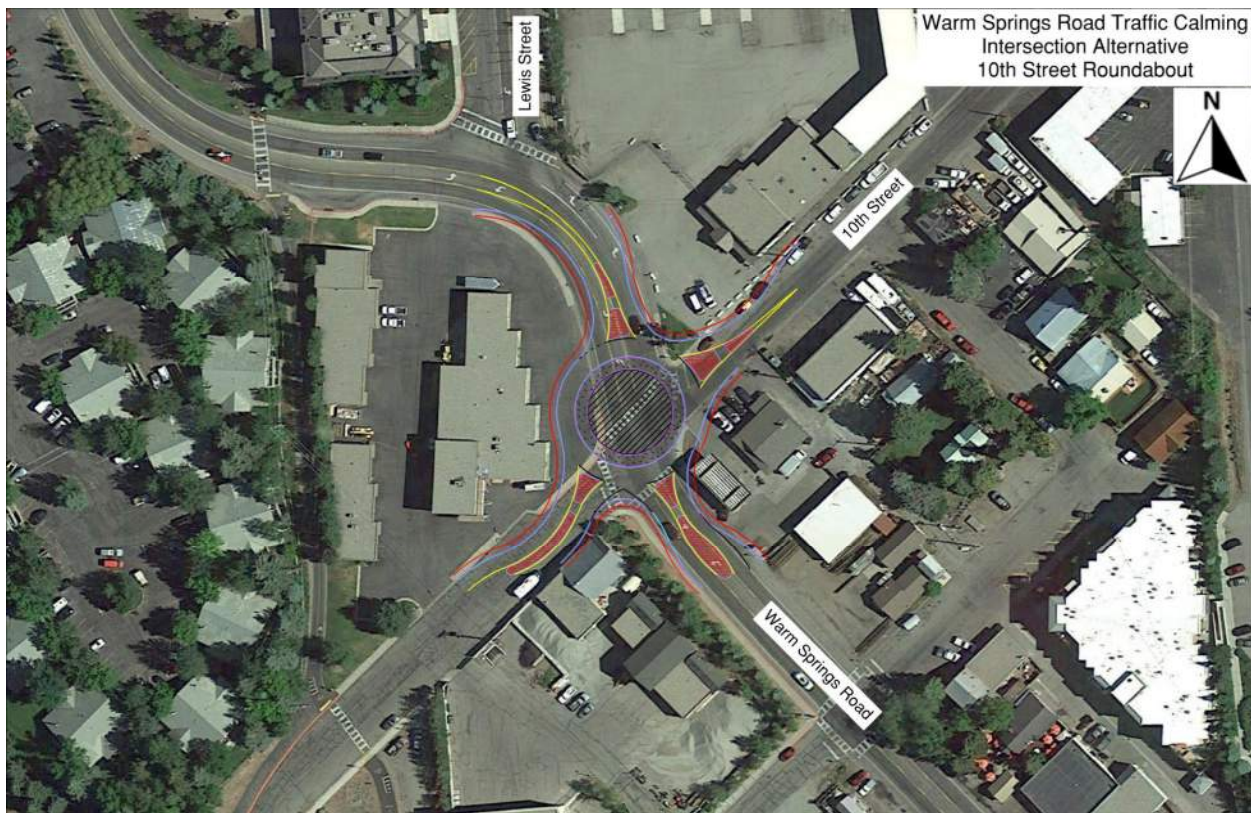


Figure 12. Concept Alternative 1



### 3.1.2 Concept Alternative 2 - Lewis Street Roundabout

Figure 13 shows the concept for Alternative 2. This alternative replaces the existing stop-controlled Warm Springs Road and Lewis Street intersection with a single lane roundabout. This concept provides good vehicle operations while requiring drivers to slow down approaching and moving through the intersection. Pedestrian facilities would be provided on all legs, connecting to existing facilities, and bikes would be able to travel through the roundabout due to low vehicle speeds or on pathways around the circle, crossing the legs in the pedestrian crosswalks. The bus stop on the west leg would be updated with this alternative. This concept would require widening the intersection with estimated private and public parking and access impacts. The adjacent Warm Springs Road and 10<sup>th</sup> Street intersection is not improved with this alternative.

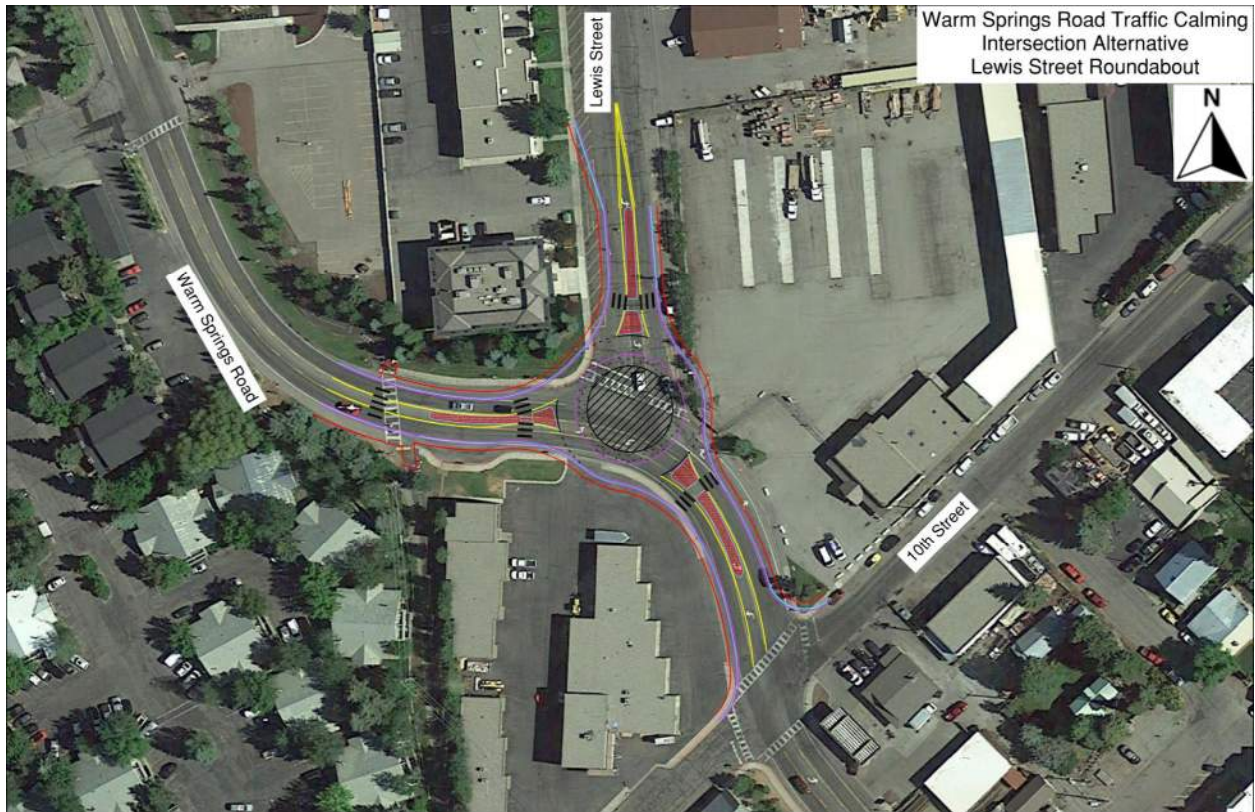


Figure 13. Concept Alternative 2

### 3.1.3 Concept Alternative 3 - 10<sup>th</sup> Street and Lewis Street Dog Bone Roundabout

Figure 14 shows the concept for Alternative 3. This alternative replaces the existing stop-controlled Warm Springs Road intersections at both 10<sup>th</sup> Street and Lewis Street with a single lane “dog bone” roundabout. A dog bone roundabout does not form a complete circle but instead has a “raindrop” or “teardrop shape” in the middle that connects two roundabout intersections. In this case, the two intersections operate as a single larger intersection connected by the dog bone roundabout. This alternative has similar benefits and impacts described for Alternatives 1 and 2. It increases out-of-direction travel for vehicles turning left from some approaches as they must navigate around the entire dog bone to reach the desired street. Pedestrians and bikes potentially have more out-of-direction travel as well.

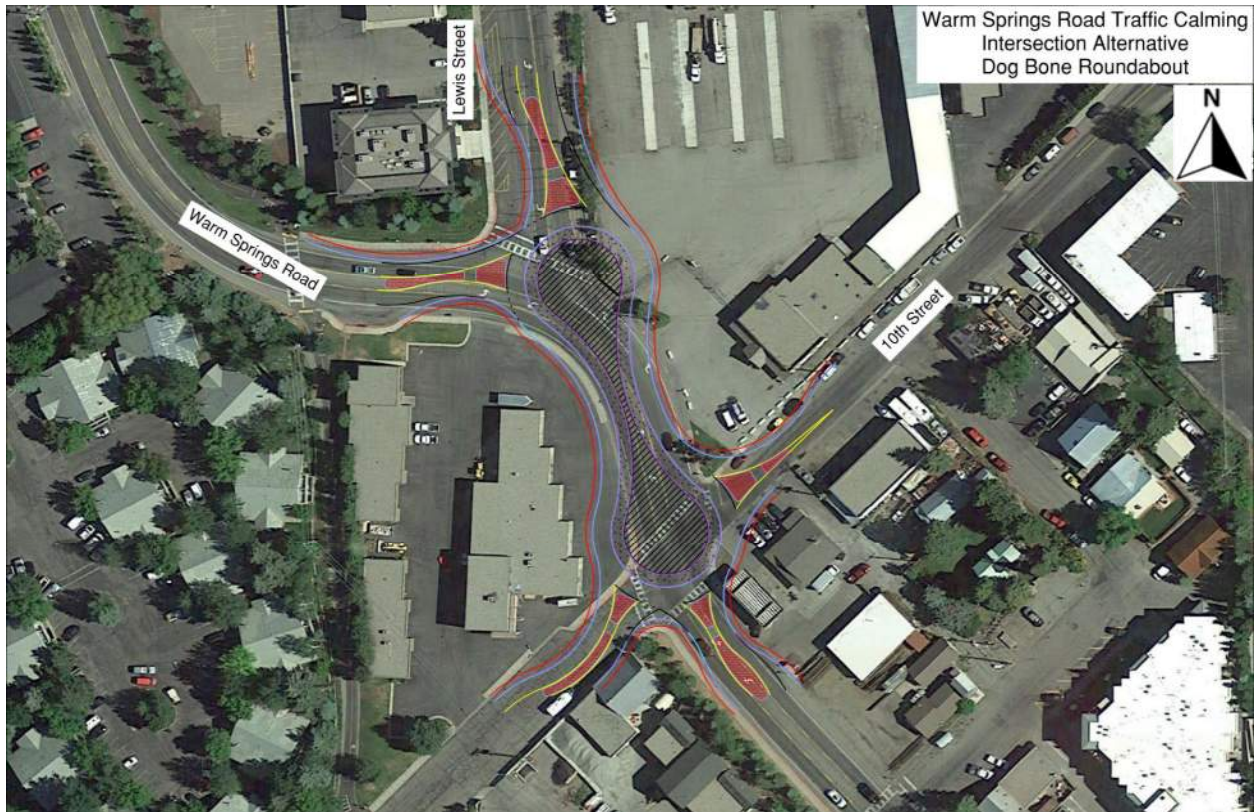


Figure 14. Concept Alternative 3

### 3.1.4 Concept Alternative 4 – 10<sup>th</sup> Street & Lewis Street Realignment & Roundabout

Figure 15 shows the concept for Alternative 4. This alternative realigns 10<sup>th</sup> Street between Warm Springs Road and SH-75 to the north and west to match into the Lewis Street and Warm Springs Road intersection, cutting through the adjacent property. The Lewis Street leg is realigned to the east and a single lane roundabout is developed to serve the new four-leg intersection. The existing 10<sup>th</sup> Street between Warm Springs Road and SH-75 is proposed to be disconnected from Warm Springs Road but could remain as an access to existing businesses along with Leadville Avenue. The abandoned roadway could also be negotiable for incorporation in development opportunities for adjacent landowners.

As with the other roundabout alternatives, this concept provides good vehicle operations while requiring drivers to slow down approaching and moving through the intersection. Pedestrian facilities would be provided on all legs, connecting to existing facilities, and bikes would be able to travel through the roundabout due to low vehicle speeds or on pathways around the circle, crossing the legs in the pedestrian crosswalks. The bus stop on the west leg of Warm Springs Road would be updated with this alternative. This concept would require widening the intersection with estimated private and public parking, access, and building impacts along with splitting the parcel in the northeast corner. The adjacent Warm Springs Road and 10<sup>th</sup> Street intersection is updated with this alternative by removing the east leg, as described.

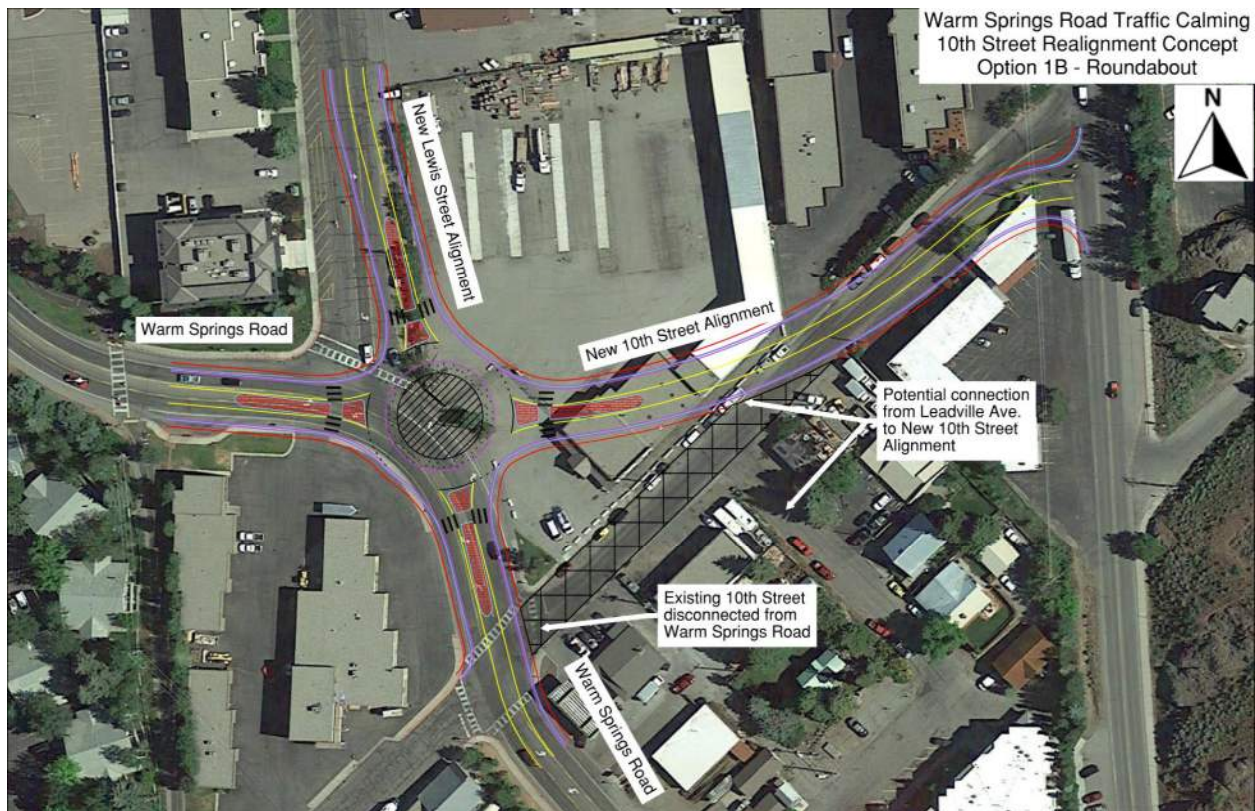


Figure 15. Concept Alternative 4

### 3.1.5 Concept Alternative 5 – Block/Street Realignment

Figure 16 shows the concept for Alternative 5. This alternative realigns Lewis Street to line up with Leadville Avenue and realigns Warm Springs to be a more direct north/south connection through the adjacent parcel. A new east/west street connects Warm Springs Road and Lewis Street, creating a new block between the realigned Warm Springs Road, realigned Lewis Road, 10th Street, and the new street. The intersections are assumed to be stop controlled in each corner of the new block.

Alternative 5 differs from the others because it includes new local street alignments that impact several parcels. It removes most of the curves in these streets while introducing more intersections to the area.



Figure 16. Concept Alternative 5

## 3.2 First Public Involvement Summary

The first public involvement meeting was held on May 5, 2022, to show the public the different improvement concept alternatives. Online surveys were also available for 2 weeks after the in-person meeting to allow the public to view the alternatives and provide feedback. Public involvement results are shown in **Appendix C**. In total, 219 responses were recorded via the online survey. Not every respondent answered every question.

The results of the public involvement meetings indicated that most people were dissatisfied with the existing intersection configurations and 77 percent of individuals (137 out of 177) said the intersections should be reconfigured or adjusted. One hundred forty-four of 172 individuals (84 percent) said pedestrian enhancements should occur. When asked to rank the different alternatives from first to last, Alternative 4 received the most support, followed by Alternative 1. Alternative 5 received the least support.

### 3.3 High Level Screening

The project team developed a screening process to evaluate each of the alternatives using 11 separate criteria identified in discussion with the City staff, at the public meeting, and during other project update meetings. Detailed descriptions of each criterion can be found in **Appendix D**.

- Safety
- Improved Connectivity for All Modes
- Warm Springs Road Crossings Improvements
- Split Parcels
- Building Removal
- Parking Impacts
- Improve Existing Business Access & Connectivity
- Opportunity for Redevelopment and/or Placemaking
- Traffic Calming
- Reduce the Number of Intersections/Driveways on Warm Springs Road
- Serve as Parade Detour Route

City staff and members of the project team gave each alternative a score of **GOOD**, **NEUTRAL**, or **POOR** for each of the criteria. A **GOOD** score received +1 point while a **POOR** score received -1 point. A **NEUTRAL** score received 0 points. An overall “score” was given to each alternative by adding up the number of **GOOD** scores and subtracting the number of **POOR** scores. A **NEUTRAL** score for a given criterion neither helped nor hurt an alternative.

#### 3.3.1 Concept Alternative Screening Results

A meeting was held on July 8, 2022, to discuss each alternative, compare the criteria evaluations, and reconcile screening from each evaluator to identify the top two alternatives to move into a more detailed qualitative analysis and screening. City staff and the project team were consistent in identifying the two alternatives to carry forward as Concept Alternative 2 – Lewis Street Roundabout and Concept Alternative 4 – 10<sup>th</sup> Street & Lewis Street Realignment & Roundabout. Table 5 summarizes the screening process final scoring. Figure 17 also shows a graphical representation of the final score totals.



**Table 5. Screening Matrix**

Concept Alternative / Criterion	No Build	1– 10 <sup>th</sup> Street Roundabout	2 - Lewis Street Roundabout	3 - 10 <sup>th</sup> Street and Lewis Street Dog Bone Roundabout	4– 10 <sup>th</sup> Street & Lewis Street Realignment & Roundabout	5 – Block/Street Realignment
Safety	NEUTRAL	GOOD	GOOD	GOOD	GOOD	POOR
Improved Connectivity for All Modes	POOR	GOOD	GOOD	POOR	GOOD	GOOD
Warm Springs Road Crossings Improvements	POOR	NEUTRAL	GOOD	GOOD	GOOD	POOR
Split Parcels	GOOD	GOOD	GOOD	POOR	POOR	POOR
Building Removal	GOOD	POOR	GOOD	POOR	POOR	POOR
Parking Impacts	GOOD	POOR	GOOD	POOR	GOOD	POOR
Improve Existing Business Access & Connectivity	POOR	POOR	NEUTRAL	POOR	GOOD	GOOD
Opportunity for Redevelopment and/or Placemaking	POOR	NEUTRAL	NEUTRAL	NEUTRAL	GOOD	GOOD
Traffic Calming	POOR	GOOD	GOOD	GOOD	GOOD	GOOD
Reduce the Number of Intersections/Driveways on Warm Springs Road	NEUTRAL	GOOD	NEUTRAL	GOOD	GOOD	POOR
Serve as Parade Detour Route	GOOD	GOOD	GOOD	POOR	GOOD	GOOD
<b>Total Green Score</b>	<b>4</b>	<b>6</b>	<b>8</b>	<b>4</b>	<b>9</b>	<b>5</b>
<b>Total Red Score</b>	<b>-5</b>	<b>-3</b>	<b>0</b>	<b>-6</b>	<b>-2</b>	<b>-6</b>
<b>Green – Red Total Score</b>	<b>-1</b>	<b>3</b>	<b>8</b>	<b>-2</b>	<b>7</b>	<b>-1</b>



Figure 17. Total Scores

### 3.4 Alternatives Selected

At a City Council meeting on July 18, 2022, HDR and City staff recommended that the City move Alternative 2, Alternative 4, and the No Build option into a qualitative analysis. The City Council concurred with the recommendation and advanced the three alternatives for more analysis.

Each of the identified alternatives had issues requiring further investigation, mitigation, and comparison in the qualitative analysis. The project team updated the conceptual layouts to address the following issues, as appropriate.

- No Build
  - Add sidewalk to eliminate sidewalk gaps and improve pedestrian ramps, where possible, to improve pedestrian connectivity and ADA/PROWAG compliance.
  - Evaluate existing access near Warm Springs Road/10th Street intersection to improve safety and pedestrian facilities.
- Concept Alternative 2 – Lewis Street Roundabout
  - Verify and update access changes to adjacent properties/businesses.
  - Address Warm Springs Road/10<sup>th</sup> Street intersection skew, if possible.
  - Adjust on street parking on Lewis Street.
- Concept Alternative 4 – 10<sup>th</sup> Street & Lewis Street Realignment & Roundabout
  - Verify and update access changes to adjacent properties/businesses.
  - Address Warm Springs Road/10<sup>th</sup> Street intersection/business access.
  - Update intersection of 10<sup>th</sup> Street/SH-75 to avoid right-of-way (ROW)/building impacts.

## 4 Detailed Analysis

### 4.1 Future Land Use and Public Realm Opportunities

The three alternatives feature differing options to enhance the area. Alternative 4 has the most potential benefit followed by Alternative 2, while the No Build option provides fewer opportunities. Coordination with adjacent business owners will be required to fully realize the benefits of each alternative. The following sections summarize the opportunities that each alternative could provide the City.

#### 4.1.1 No Build

The No Build option provides no changes to the land use or public realm opportunities. The large, underdeveloped parcel owned by Albertsons could still be redeveloped. The transition from the downtown core to the light industrial zone on Warm Springs Road would not be improved. The quick transition of land uses in the area may still lead to a disjointed experience.

#### 4.1.2 Alternative 2 – Lewis Street Roundabout

Alternative 2 provides several opportunities to enhance the area. The alternative allows for development of the large undeveloped parcel owned by Albertsons, and there is potential to



provide enhanced features for pedestrians, bikes, and placemaking. Extra space at the southern portion of the Albertsons' parcel could allow for a distinctive plaza to be created providing the needed space for a gateway element identifying a transition in and out of the downtown core. The roadway improvements will require some ROW from surrounding businesses but the impact to the parcels is minimal.

The opportunity also has potential to enhance placemaking in the area. Space inside the roundabout could be used for public realm enhancements such as artwork, specialty landscaping, or signage and wayfinding. New roadway improvements enable public realm and placemaking elements to continue farther down Warm Springs Road and Lewis Street along the streets themselves. Public realm and placemaking elements that could be incorporated include wide detached sidewalks/pathways, tree coverage, specialty paving, signage and wayfinding, and/or artwork.

#### **4.1.3 Alternative 4 – 10<sup>th</sup> Street & Lewis Street Realignment & Roundabout**

Similar to Alternative 2, the realigned roundabout in Alternative 4 provides opportunity to enhance the area. The alternative allows for developing the large undeveloped parcel owned by Albertsons, and there is potential to provide enhanced features for pedestrians, bikes, and placemaking. A new parcel would be formed between Warm Springs Road and Leadville Avenue with frontage to the proposed roundabout. Land use at this site could be commercial, continuing the downtown feel farther up Warm Springs Road. The parcel could also be sold to adjacent businesses to aid in the redevelopment and enhancement of those parcels. Roadway improvements will have impacts to existing businesses and roads such as 10<sup>th</sup> Street, Leadville Avenue and Lewis Street.

## **4.2 Forecasted Travel Patterns**

### **4.2.1 Study Year, Target LOS and Growth Rates**

For the purposes of this study, the project team identified year 2042 as the design year for the improvements. Per section A.15 of the Idaho Transportation Department's *Roadway Design Manual*, a target LOS D was set to analyze the intersection improvements. According to the manual, this LOS standard is "applicable for Federal-aid construction on State and local highway excluding highways on the National Highway System." Should the project receive federal funding, identified improvements would need to meet the LOS D threshold.

Since 10<sup>th</sup> Street intersects Main Street (SH-75), which is an ITD roadway, a target LOS D was set for the intersection improvements per Table A-3 in section A.15.01 of ITD's *Roadway Design Manual*<sup>4</sup>.

The City of Ketchum does not lie within boundaries of a Municipal Planning Organization (MPO) that would produce a travel demand model that projects trip generation out into the future. Therefore, the project team calculated an average growth rate to represent traffic volume growth.

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<sup>4</sup> Idaho Transportation Department (ITD). Roadway Design manual. 2012

Traffic volumes on SH-75 were analyzed using historical data from ITD’s ATRs to see how they have grown between 1990 and 2019. Due to the Covid 19 pandemic shutdowns, 2020 data was again excluded. Historical data from the ATR stations show patterns of steady and rapid growth on SH-75 up to the early 2000s, followed by a steep decline that coincides with the Great Recession. Traffic volumes started increasing again around 2012 and have steadily increased each year approaching the highest volumes seen before the Great Recession. Using the ATR data, the project team calculated a historical annual average growth rate of 1.44 percent for SH-75 and applied it as a regional growth factor for the City of Ketchum. Figure 18 shows the change in traffic volumes since 1990.

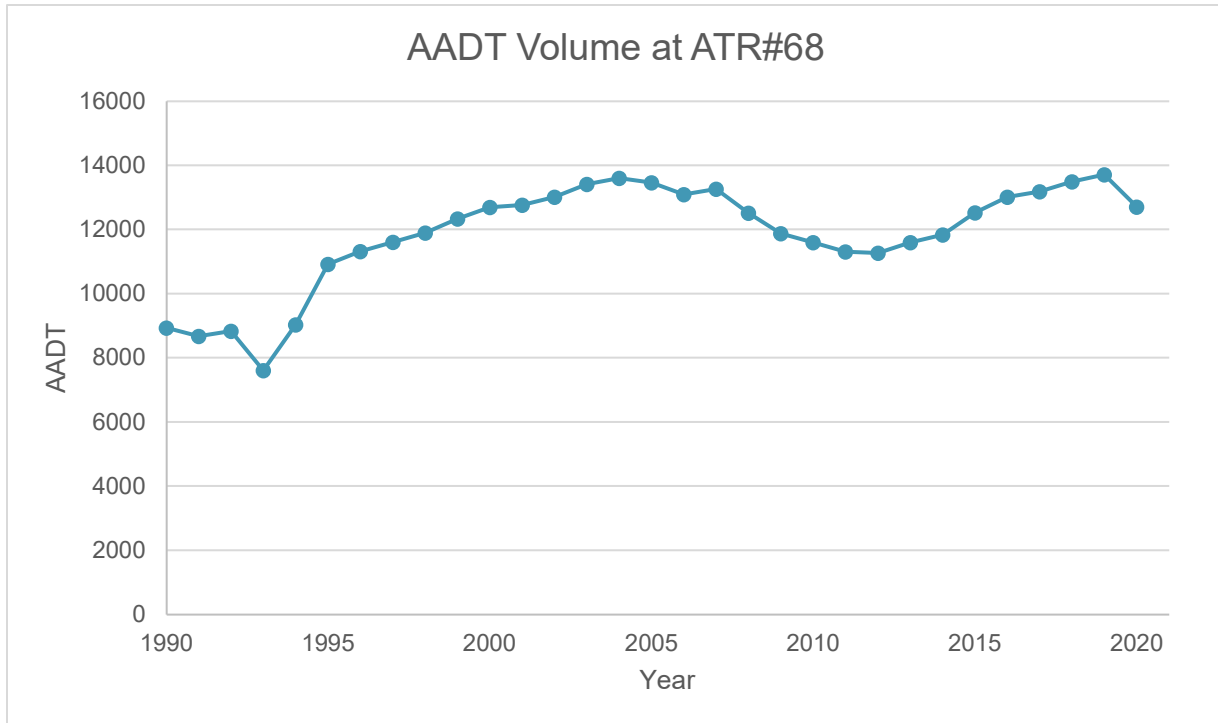


Figure 18. Traffic Volumes since 1990

While the City of Ketchum has experienced recent traffic growth, it also is a resort destination City that is sensitive to economic downturns. Over the design life of the improvements, one can reasonably expect an economic downturn and traffic growth to slow or decline as compared to recent trends. The historical 1.44 percent calculated smooths out the ups and downs that the City may experience throughout the future economic cycles and provides a growth scenario consistent with historical trends.

#### 4.2.2 Forecasted Travel Patterns

HDR applied the historical growth rates to the unadjusted August count volumes to estimate future travel demand. For Alternative 2 and the No Build option, the growth rate was applied to the turning movements directly. However, Alternative 4 removes a portion of 10<sup>th</sup> Street and converts the intersection of 10<sup>th</sup> Street and Warm Springs from a four-way intersection into a T-intersection. 10<sup>th</sup> Street traffic is then rerouted to a new four-way intersection at Warm Springs Road and Lewis Street. For this new intersection, traffic demand entering and leaving the study

area was assumed to remain the same and turning movement volumes were estimated using the iterative procedure – directional method outlined in National Cooperative Highway Research Program (NCHRP) 765, *Analytical Travel Forecasting Approaches for Project-Level Planning and Design*<sup>5</sup>. The directional method uses an iterative approach to alternatively balance entering traffic and departing traffic volumes until an acceptable level of convergence is reached. The T-intersections turning movements were manually reconfigured assuming similar traffic patterns. Results of the turning movement analysis are shown in Figure 19 and Figure 20.

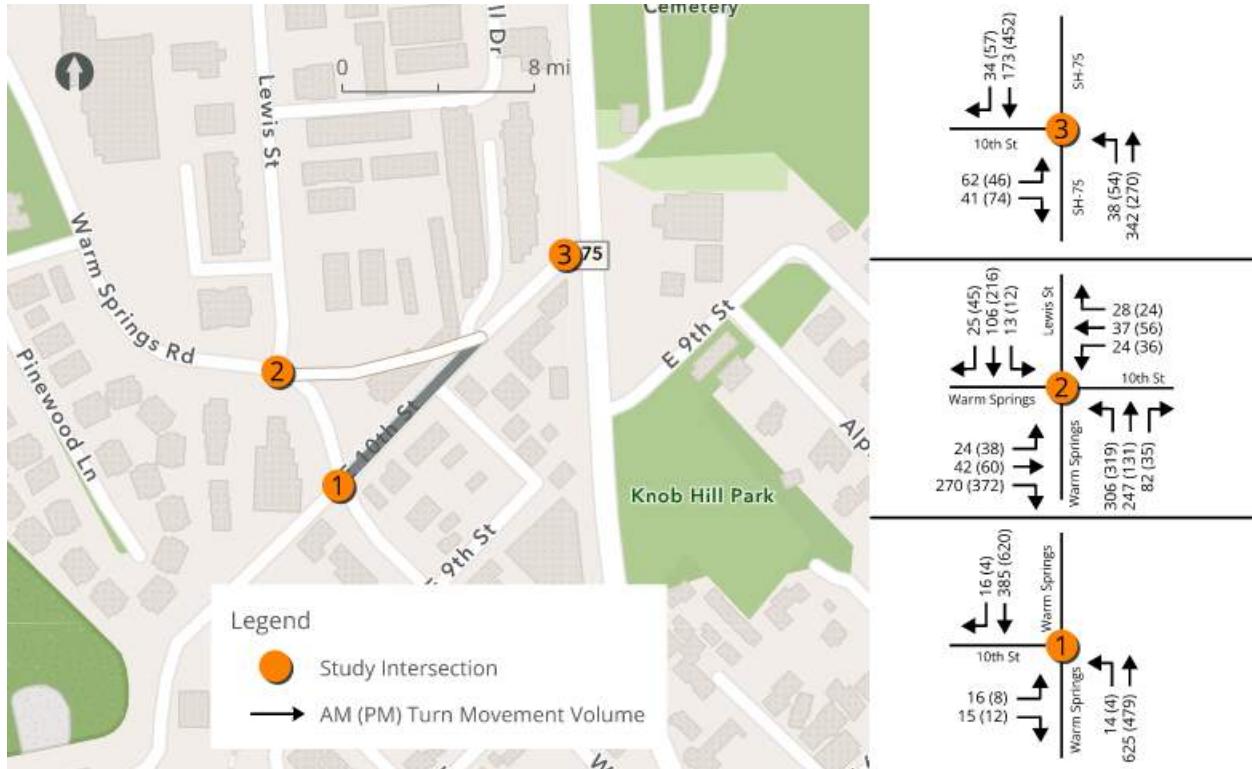


Figure 19. Alternative 4 Peak Volumes

<sup>5</sup> National Cooperative Highway Research Program (NCHRP). Report 765. Analytical Travel Forecasting Approaches for Project-Level Planning and Design. Transportation Research Board of the National Academies. 2014.

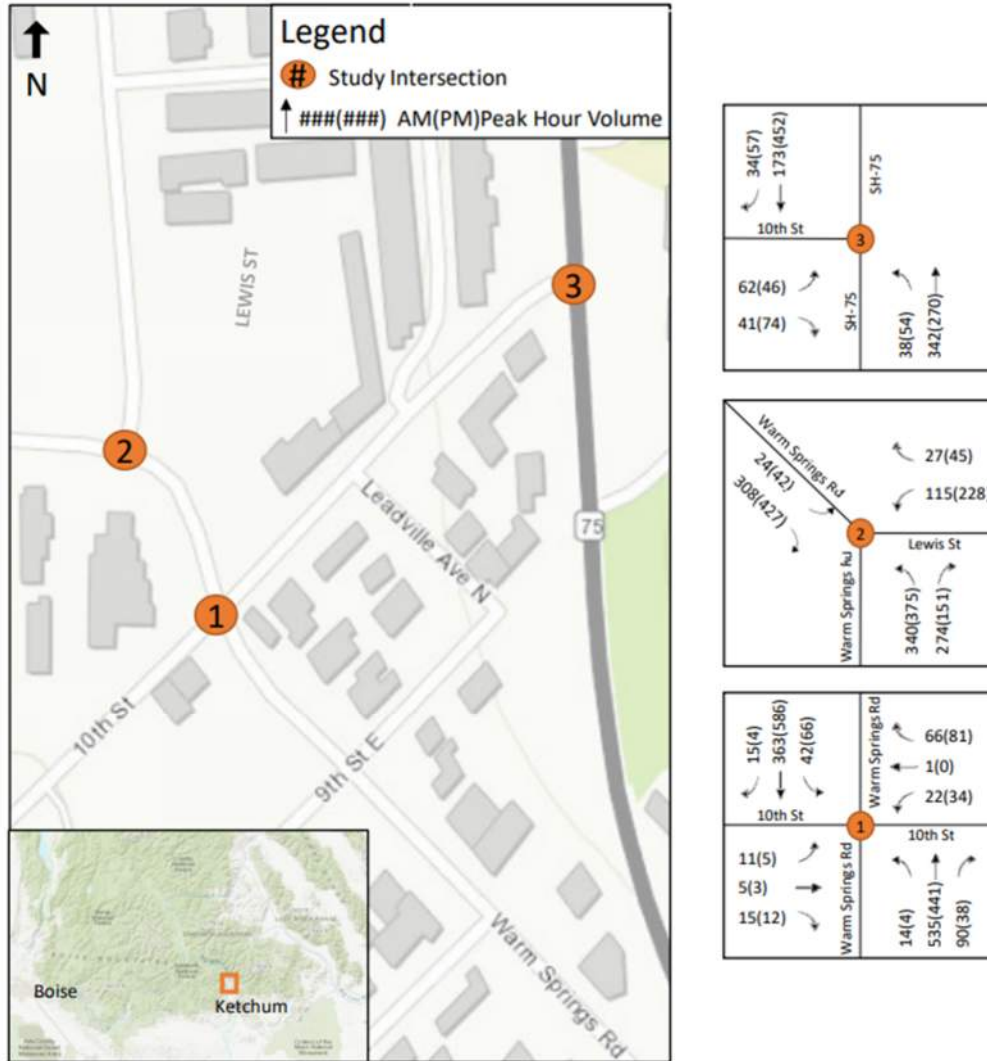


Figure 20: No Build and Alternative 2 Peak Volumes

### 4.3 Future Capacity Analysis

#### 4.3.1 Analysis Software and Settings

The project team used SIDRA 9 software to analyze the roundabout alternatives and Synchro 11 software to analyze the stop-controlled intersections. Both software programs use the HCM methodology to compute delay, LOS, and V/C ratios. The peak hour factor for the future scenarios was set at 0.92 per HCM recommendations.

#### 4.3.2 No Build Results

In the No Build option, the three study intersections are expected to experience longer delays than in the existing conditions; however, they are estimated to operate at or above the LOS D threshold. The movements on Warm Springs Road continue to see shorter delays; however, the increased volume on Warm Springs Road decreases the number of gaps available for vehicles on the side streets. The 10<sup>th</sup> Street and Warm Springs Road intersection side street operations

decrease from LOS B to LOS C or D and the Warm Springs Road and Lewis Street intersection decreases to a LOS D from LOS B. Results are presented in Table 6 and detailed results can be found in **Appendix E**.

**Table 6. No Build Traffic Operations - August 2042 AM & (PM) Peak**

Intersection	Overall Intersection LOS	Movement	Delay (s)	LOS	95 <sup>th</sup> Percentile Queue Length (feet)	V/C
10 <sup>th</sup> Street / Warm Springs Road	C (D)	NET/L/R	18 (23.5)	C (C)	6.6 (6.6)	0.09 (0.10)
		SWT/L/R	16.7 (27.7)	C (D)	17.6 (48.4)	0.22 (0.45)
		SBL	8.8 (8.7)	A (A)	2.2 (4.4)	0.04 (0.07)
		NBL	8 (8.8)	A (A)	0 (0)	0.01 (0.01)
10 <sup>th</sup> Street / SH-75	B (C)	NEL	7.7 (18.2)	A (C)	2.2 (30.8)	0.03 (0.32)
		NBT/L	12.4 (8.7)	B (A)	13.2 (4.4)	0.16 (0.06)
Warm Springs Road/ Lewis Street	C (D)	SBL	15.2 (27.3)	C (D)	22.0 (88.0)	0.26 (0.62)
		SBR	14.3 (11.0)	B (B)	2.2 (4.4)	0.04 (0.08)
		SEL	9.0 (8.7)	A (A)	2.2 (2.2)	0.03 (0.05)

The presence of a TWLT lane at the Warm Springs Road and Lewis Street intersection allows for a two-stage southbound left turn movement; vehicles will first turn into the turn lane and then merge into traffic. The HCM methodology assumes a smaller gap acceptance with a TWLT lane than if traffic were to pull out directly into traffic. Therefore, the HCM assumes TWLT lanes increase capacity at an intersection. Without the TWLT lane, the southbound left turn at Lewis Street is estimated to operate at LOS F in the PM peak hour with delays exceeding 90 seconds.

**4.3.3 Alternative 2 – Lewis Street Roundabout**

**Table 7. Alternate 2 Traffic Operations - August 2042 AM & (PM) Peak**

Intersection	Overall Intersection LOS	Movement	Delay (s)	LOS	95 <sup>th</sup> Percentile Queue Length (feet)	V/C
Warm Springs Road/ Lewis Street	A (A)	NET/L/R	8.2 (7.3)	A (A)	103.0 (79.2)	0.51 (0.45)
		SWT/L/R	5.6 (7.9)	A (A)	18.8 (42.3)	0.17 (0.34)
		ET/L/R	6.0 (9.3)	A (A)	42.6 (78.6)	0.31 (0.49)

The results of the analysis presented in Table 7 show that the proposed roundabout at 10<sup>th</sup> Street and Warm Springs Road is estimated to operate at LOS A during the design year using the August 2042 volumes. The V/C ratios for each leg are all under 0.85 suggesting that excess

capacity exists to handle an increase in traffic volumes if they increase faster than projected. The 10<sup>th</sup> Street intersections will not be improved and are expected to operate similarly to the No Build option scenario.

#### 4.3.4 Alternative 4

**Table 8. Alternative 4 Traffic Operations - August 2042 AM & (PM) Peak**

Intersection	Overall Intersection LOS	Movement	Delay (s)	LOS	95 <sup>th</sup> Percentile Queue Length (feet)	V/C
10 <sup>th</sup> Street / Warm Springs Road / Lewis Street	A (A)	NBT/L/R	9.5 (7.7)	A (A)	116.1 (73.9)	0.56 (0.45)
		WBT/L/R	6.7 (6.4)	A (A)	14.2 (17.3)	0.14 (0.16)
		SBT/L/R	5.9 (8.4)	A (A)	19.6 (43.8)	0.18 (0.35)
		EBT/L/R	6.3 (10.0)	A (B)	44.5 (93.3)	0.32 (0.52)
10 <sup>th</sup> Street / Warm Springs Road	C (C)	NWL	8.2 (8.9)	A (A)	0 (0)	0.01 (0.01)
		NEL/R	17.4 (17.7)	C (C)	6.6 (4.4)	0.10 (0.07)

The re-aligned roundabout provides nearly the same LOS for the roundabout as Alternative 2 as presented in Table 8. The roundabout delays remain low at 10 seconds or less and V/C ratios under 0.85. Again, excess capacity is present in the roundabout for an increase in traffic. The overall LOS for the roundabout is A in both the AM and PM peaks. The 10<sup>th</sup> Street intersection near the Ernest Hemingway STEAM School is converted into a T-intersection and Warm Springs Road is expected to operate with minimal delays. The side street of the T-intersection will operate at LOS C and experience approximately 17 seconds of delay during the peak hours. The 10<sup>th</sup> Street intersection with Main Street will operate as shown in the No Build option scenario.

### 4.4 Impacts to Transit, Pedestrians and Bikes

#### 4.4.1 No Build

The No Build option provides no improvement for transit, pedestrians, or bikes.

#### 4.4.2 Alternative 2 – Lewis Street Roundabout

Mountain Rides eastbound bus stop facilities on Warm Springs Road would likely need to be relocated to provide access to the adjacent parcel. Based on conversations with Mountain Rides, bus routes would be unimproved by the change, but not negatively impacted by the roundabout.

This option would enhance bike connectivity. The bike lanes can be extended to the roundabout where ramps would transition cyclists to multi-use pathways to circulate around the roundabout away from vehicle traffic. Roundabouts generally slow traffic, which would provide an opportunity for experienced cyclists to traverse the intersection in the vehicle lanes, if desired.

Pedestrian connectivity would be improved with this option. The long crossing distance at Lewis Street would be eliminated. Sidewalks would be installed on Warm Springs Road where there are none, thereby enhancing connectivity. Slower vehicle speeds would decrease pedestrian stress while using the intersection. Although the Warm Springs and Lewis Street intersection would be improved with the change, the 10<sup>th</sup> Street intersection would still present a challenge to pedestrians. Due to the skewed intersection and tight ROW, the long crossing distances are likely to remain. Installing ADA/PROWAG-complaint ramps would bring the intersection into compliance.

#### **4.4.3 Alternative 4**

In Alternative 4, Mountain Rides eastbound bus stop facilities on Warm Springs Road would likely need to be relocated to provide access to the adjacent parcel. Based on conversations with Mountain Rides, bus operations would be improved with this option. Instead of busses turning right onto Warm Springs from 10<sup>th</sup> Street, this movement would become a through movement in the roundabout once 10<sup>th</sup> Street is realigned.

Like Alternative 2, this option would enhance bike connectivity. The bike lanes could be extended to the roundabout where ramps would transition cyclists to multi-use pathways to circulate around the roundabout away from vehicle traffic. Roundabouts generally slow traffic, which would provide an opportunity for experienced cyclists to traverse the intersection in the vehicle lanes, if desired.

Pedestrian connectivity would be improved with this option. The long crossing distance at Lewis Street would be eliminated. Sidewalks would be installed on Warm Springs Road where there are none, thereby enhancing connectivity. Slower vehicle speeds would decrease pedestrian stress while using the intersection. This option would also eliminate the skewed crossings at the 10<sup>th</sup> Street intersection.

## **4.5 Future Safety Analysis**

The project team used the Federal Highway Administration's (FHWA) Crash Modification Factor (CMF) Clearinghouse<sup>6</sup> to identify the potential change in crash frequency or severity associated with the possible changes to the intersections. CMFs were selected based on study similarities to Warm Springs Road roadway conditions and star rating (minimum of three stars). Each CMF also needed to include all crash types and crash severities. When there are no CMFs available for the specific situation, a qualitative discussion is provided. The following sections summarize the findings:

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<sup>6</sup> Crash Modification Factors Clearinghouse. <https://www.cmfclearinghouse.org/>

#### 4.5.1 No Build

The No Build option would not improve safety at the location.

#### 4.5.2 Alternative 2

The proposed treatments of converting the minor road stop control to a roundabout is covered by CMF ID 227 (3 Stars), which estimates a 44 percent decrease in all crashes. With this alternative, the long pedestrian crossing on Lewis Street is split into a two-stage crossing at the roundabout. The improvements propose installing rectangular rapid flashing beacons on all three legs of the roundabout, which are covered by CMF ID 11158. This CMF estimates a 31 percent decrease in crashes.

The left-turn sight distance issue on 10<sup>th</sup> Street onto Warm Springs Road would not be eliminated with these improvements. Some mitigation measures with this option could include:

- Prohibiting this left turn movement and requiring individuals to turn right and make a U-turn through the roundabout to complete the movement.
- Eliminate parking on 10<sup>th</sup> Street to move the turn lane closer to the curbing.
- Revising the striping on the east leg of the 10<sup>th</sup> Street and Warm Springs to be a left-turn lane instead of a TWLT lane, which would prevent delivery vehicles from parking so close to the intersection.

#### 4.5.3 Alternative 4

The proposed treatments of converting the minor road stop control to a roundabout is covered by CMF ID 227 (3 Stars), which estimates a 44 percent decrease in all crashes. With this alternative, the long pedestrian crossing on Lewis Street is split into a two-stage crossing at the roundabout. The improvements propose installing rectangular rapid flashing beacons on all four legs of the roundabout, which are covered by CMF ID 11158. This CMF estimates a 31 percent decrease in crashes. The 10<sup>th</sup> Street left-turn sight distance issue would be eliminated.

### 4.6 Opinion of Probable Costs

Typically, roadway projects can be evaluated using a cost/benefit analysis, where alternative costs can be compared to potential safety benefits to determine if the alternative would be beneficial to the public. In this case, crashes within the project area are so infrequent that it would be hard to reach an acceptable benefit-over-cost ratio with any alternative. The benefits to the community may come from improvements to the public realm and a decrease to pedestrian and biker stress when using the roadway. These factors are hard to quantify; therefore, the alternatives are evaluated on total project costs.

The build alternatives probable costs are summarized in Table 9. Three costs were estimated for each alternative: engineering fee, construction costs, and right-of-way costs. Based on experience, the engineering fee is estimated to be approximately 15% of the construction costs. The ROW costs are estimated based upon conceptual layouts and prices provided by a ROW agent contracted with the City.





**Table 9. Project Alternatives – Total Project Costs**

Cost	Alternative 2	Alternative 4
Engineering Fee	\$288,000	\$398,000
Construction Cost	\$1,532,000	\$2,117,000
Right-of-way Cost	\$1,075,100	\$4,461,700
<b>Total Project Cost</b>	<b>\$3,278,100</b>	<b>\$7,506,700</b>

As with all costs, ROW and construction costs are subject to market changes and could increase or decrease depending on economic conditions. Each cost is based on current year (2022) unit prices and dollar values and adjustment factors are not applied for a future construction year. Comparatively, Alternative 4 would remain more costly than Alternative 2 in future years.

ROW costs make up the largest difference between the two alternatives. Alternative 4 creates an opportunity for the City to vacate the abandoned 10<sup>th</sup> Street connection and sell it to adjacent land owners. The vacated parcel’s estimated value is \$1,277,325 and the revenue from the sale could be used to offset some of the ROW costs, but that would need to be determined during ROW negotiations.

## 4.7 Second Public Meeting Summary

A second public meeting was held on October 3, 2022, followed by 2 weeks of online public comment. The public meeting consisted of three separate presentations (one each in the morning, mid-day and evening) that outlined the results of the concept study, presented revised concept exhibits for Alternatives 2 and 4, and reported the benefits or drawbacks of each alternative. For individuals who could not go to the meeting in person, an online form was made available for the public to provide feedback. Additionally, the public meeting included a presentation on a concept study project concerning Main Street between 6<sup>th</sup> Street and River Street and the online survey reflected both projects.

The results of the in-person meetings showed most people preferred Alternative 4 at 60 percent compared to 40 percent for Alternative 2. A summary of the online public involvement results can be found in **Appendix F**.

# 5 Recommendations and Next Steps

## 5.1 Comparing the Alternatives

Alternative 4 provides the most benefit to all modes of travel and has the most opportunity to improve the public realm. The re-aligned roadway would simplify the roadway network and remove most of the perceived safety issues. To achieve these benefits, the alternative would greatly impact adjacent parcels. Alternative 2 would similarly calm traffic and remove safety issues at the Lewis Street and Warm Springs Road intersection but would not address issues at the Warm Springs Road and 10<sup>th</sup> Street intersection. The placemaking opportunities would not be as robust as with Alternative 4 but could still be significant in providing a transition from the

downtown core to the light industrial or residential areas. Final concept exhibits can be found in **Appendix G**.

Alternative 2 is expected to be significantly less expensive than Alternative 4 primarily because it does not require purchase of large amount of ROW on the undeveloped Albertsons parcel. There could be opportunities to reduce ROW costs for Alternative 4 during the negotiation process. For example, the City could vacate the 10<sup>th</sup> Street parcel and the adjacent landowners could purchase the property, thereby offsetting ROW costs elsewhere.

## 5.2 Recommendation and Interim Improvements

If the City can acquire funding to cover the higher ROW and construction costs, Alternative 4 is recommended. The alternative best improves multi-modal connectivity and operation, simplifies the roadway network, provides the most opportunity for placemaking, and is preferred by both Mountain Rides and the public. If the higher amount of funding is not available, then Alternative 2 is recommended as this option still provides traffic calming, multi-modal, placemaking, and safety benefits to the area. The No Build option is not recommended as it does not provide benefits meeting the City's goals.

As the City pursues funding for the larger aspects of the build alternatives, there are several opportunities to enhance the area in the meantime. Even if the City chooses the No Build option, the City could consider the following improvements.

- Restripe the TWLT in front of the gas station to be a dedicated left turn lane. This will prevent delivery vehicles from parking close to the intersection.
- Replace dilapidated sidewalk, install sidewalk where none exists within the study area, and install ADA/PROWAG complaint pedestrian ramps.
- Install bulb-outs at the Lewis Street and Warm Springs Road intersection to shorten pedestrian crossings (Figure 21).



**Figure 21. Example Bulb-outs at Lewis Street**

- Explore one or more of the following options to mitigate the difficult 10<sup>th</sup> Street left turn sight distance issue:
  - Prohibit southbound left turns at the intersection by signage or adding a diverter in the intersection.
  - Convert the intersection from two-way stop control to all-way stop control.

### 5.3 Mitigating Impact of Future Nearby Developments

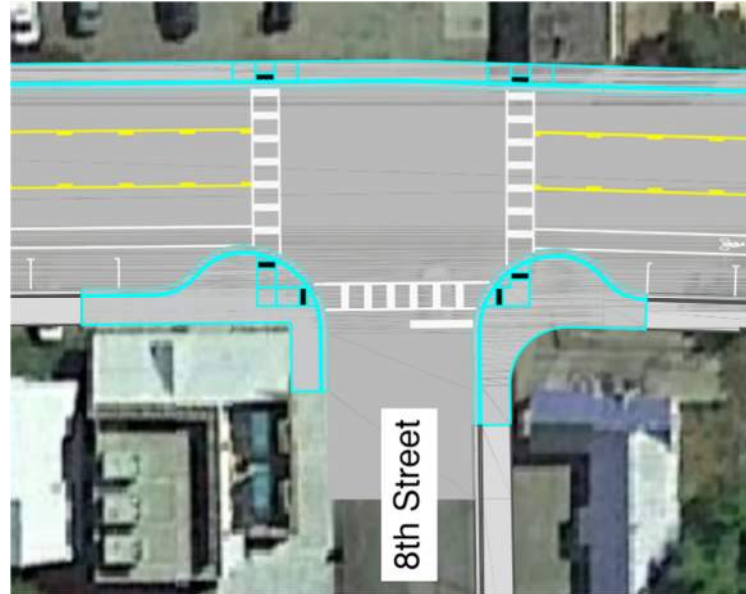
If there is a large time gap between the selection of the preferred alternative and construction such that nearby parcels are developed, the City should require the developments to submit a traffic impact study and evaluate how those developments will impact the selected alternative. Large high-density developments, multi-family homes, or new traffic generators along Warm Springs Road could impact estimated future operations. The roundabout options are shown to have excess capacity, but major changes to travel patterns may require re-evaluation with the traffic generated specifically by the new development. Opportunities may exist to coordinate placemaking opportunities with adjacent development as well as mitigate traffic impact.

Traffic circulation of developments will need to be considered depending on which alternative is selected. For example, if Alternative 2 is selected, the developer of the Albertson's parcel should avoid creating a situation that increases the number of vehicles performing southbound left turns at 10<sup>th</sup> Street onto Warm Springs Road. Although not generating crashes today, the sight distance problems at this intersection could be exacerbated if the number of vehicles making this movement is increased. One possible solution is to have most vehicles access the development from Lewis Street to reduce conflicts at 10<sup>th</sup> Street. The City should work with the developer to identify the best traffic circulation patterns as the development goes through the permitting process.

### 5.4 Nearby Enhancements to Consider

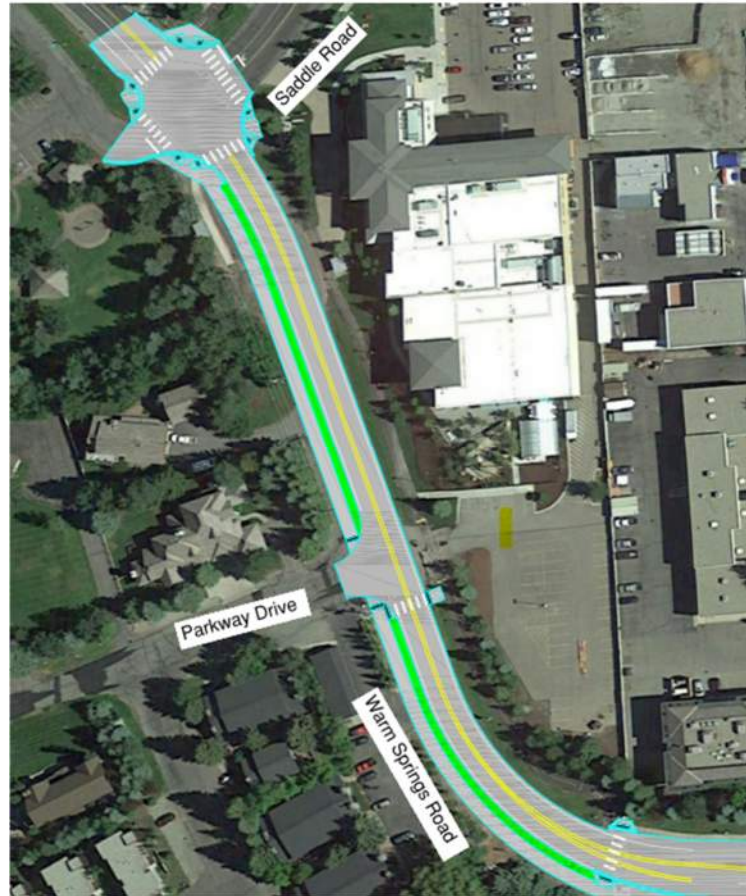
To fully realize the benefits of enhancing Alternative 2 or Alternative 4, the City should consider programming improvements between Saddle Road and 6<sup>th</sup> Street on Warm Springs Road. These improvements should be targeted at reducing pedestrian crossing widths, providing sidewalk connectivity and creating more placemaking opportunities. The following are suggested improvements:

- Install sidewalk on the north side of Warm Springs Road between 10<sup>th</sup> Street and 7<sup>th</sup> Street.
- Install bulb-outs at 9<sup>th</sup> Street, 8<sup>th</sup> Street, and 7<sup>th</sup> Street to better delineate parking and shorten pedestrian crossings (Figure 22).



**Figure 22. Example Bulb-outs at 8th Street**

- Evaluate opportunities to convert the informal pathways people use to traverse down the hill from Main Street to Warm Springs Road into formal pathways.
- Install bike lanes from 6<sup>th</sup> Street to the Wood River Trail Crossings. To reduce the need for a retaining wall, a sharrow can be installed in the downhill direction between 6<sup>th</sup> Street and 9<sup>th</sup> Street until a full lane bike lane can be developed.
- Provide a multi-use pathway on the west side of Warm Springs Road Between the Wood River Trail crossing and Saddle Road to provide access to the Wood River Trail pathway and easier pedestrian connection to the bus stops (Figure 23). This could be implemented with a lane reconfiguration to remove the center turn lane, which could also help in providing traffic calming.



**Figure 23. Example Separated Pathway Along Warm Springs Road**

- Revise the trail crossing at Saddle Road to be set back from the intersection.
- Evaluate a roundabout at the Saddle Road intersection.
- Install sidewalk on 10<sup>th</sup> Street between Warm Springs Road and Main Street.

**Appendix H** contains conceptual exhibits of possible enhancements.

## 5.5 Next Steps

The City should pursue grant opportunities to fund the recommended improvements. Outreach for stakeholder participation in the grant pursuits should occur, including Mountain Rides, Blaine County School District, and the Ketchum Urban Renewal Agency.